

In prevention of critical events resulting in major injury or damage it was vital to investigate the causation of minor episodes which resulted in little or no injury or damage. Taking note of such episodes could lead to avoidance of a subsequent catastrophe. Knowing the hazards was not enough however; education and enforcement of safety rules were crucial. It was the human machine that was the real menace.

Road traffic accidents were now the leading cause of accidental death, stated Dr. G. M. MACKAY (Birmingham), and among causes of death they resulted in the highest percentage of life years lost. They were also a growth point, and by the year 2,000 some 200,000 fatal and serious injuries per annum could be expected.

### Seat Belts

Every incident had three components: pre-crash, crash—amounting to 0.1 sec—and post crash. The first and last of these had received most emphasis in the past. However, the crash effect could be modified by protecting the head, preventing ejection of occupants, and removal of pointed objects from the car. Over half of all impacts were frontal, and a seat belt properly worn would prevent 20,000 serious injuries per annum. The choice lay between voluntary usage plus modification of the car to encourage use or making their use compulsory. The latter seemed the better course, as it would take up to 15 years before all existing vehicles were replaced and during that time 130,000 preventable major casualties would occur.

In addition, modification of steering wheels and windscreens would render cars safe. In this context the designer valued and could apply information from the doctor concerning the type and causation of physical injuries.

Professor A. K. MANT (London) drew attention to the public's mental block at road accidents by comparison with events like Flixborough. Every week 150 people were killed on the roads, five times the death total at Flixborough. In 1971 in Great Britain 352,000 road casualties occurred—7,699 fatal. Moreover one-third of this total were between 15 and 24 years of age. Among the survivors many were seriously injured, over 90,000 in 1971 alone. No figures were available in the U.K., but in Sweden 50% of serious casualties were still receiving treatment five years afterwards. The cost of road accidents in personnel and cash was enormous, estimated at £551m. in the U.K. in 1972 alone.

What then was being done to cut down the casualty rate? Car failure and bad roads had been intensively investigated and corrected, but little had been done to influence human behaviour. To remedy this, education in road safety should be an integral part of school curricula and of the driving test. The mass media had contributed in this respect, but regrettably safety campaigns did not have a lasting impact. Thus drivers were now drinking as much as they were before the 1967 campaign. Further legislation should be introduced to prevent this.

Perhaps the greatest contribution to car occupant safety was the seat belt. Remark-

able falls in serious injuries had followed wherever their use had been made mandatory. In Victoria, Australia, fatal accidents had dropped 28% and admission of drivers to hospital by over 50% since seat belt regulations were introduced. The seat belt was most effective in frontal impacts, and this type of impact occurred in over 70% of road traffic accidents.

Two important though brief contributions to reduction in road casualties were British Summer Time and the 50 m.p.h. limit. The former had resulted in a 12% reduction in casualties during the affected hours and 4% over the whole day. The force of impact at 70 m.p.h. was twice that at 50 m.p.h. Enforced limits, as in the U.S.A., would reduce and modify accidents.

Doctors had a role to play in accident prevention, said Professor Mant. Central American experience showed that traffic safety education paid off, and it should be among medical recommendations for the future.

### Australian Experience

The discussion which concluded the symposium centred on the need for seat belt legislation, with Australian visitors endorsing the speakers' comments. The chairman, Dr. P. A. B. RAFFLE, accepted a recommendation from the speakers that the B.M.A. should reaffirm its stated support for legislation to make the wearing of seat belts compulsory.

Photographs by Holderness Photographic Services.

## Contemporary Themes

### Infants, Children, and Informed Consent\*

A. G. M. CAMPBELL

*British Medical Journal*, 1974, 3, 334-338

#### Summary

Obtaining informed consent for non-therapeutic experimentation on infants and children has ethical and legal implications that cause great controversy. There is some danger that worthy research will be inhibited if current ethical codes are interpreted too strictly, yet infants, children, and other vulnerable groups clearly must be protected from exploitation as research subjects. It is suggested that permission from parents coupled with integrity

of the investigator will remain the child's best protection, but several additional protective mechanisms are available and should be used. Some guidelines for non-therapeutic research are suggested which should not only provide adequate protection for infants and young children involved in research projects, but allow investigators reasonable freedom to prosecute worthy research vital to continued improvements in child care.

Paul Ramsey, the eminent Princeton theologian, has written "I have observed that there are two conversation stoppers in gatherings of physicians. One asserts the sacredness or inviolability of the individual, in particular the requirement of an informed consent, and a consequent prohibition of investigations upon children that are not in their behalf medically—using children who are well or who are suffering from some unrelated disease for the sake of good to come. The other asserts that it is immoral not to do research or not to do a particular experiment despite its necessary deception of a human being or its necessary

\*Based on an inaugural lecture given at the University of Aberdeen, 31 January, 1974.

use of a child as but a piece of childhood in general. Medical advance would be hampered, it is alleged, if our society makes an absolute of the inviolability of the individual. This raises the spectre of a medical and scientific community freed from the shackles of that cultural norm, and proceeding upon the basis of an ethos aiming by any needed means at a calculus of good ends only."<sup>1</sup>

With the advancing technology of medicine it is not surprising that the rights of society as a whole and those of the individual should frequently be in conflict. Medicine as an instrument of social good must inevitably conflict with, and intrude into, individual rights. But need we always take extreme positions? Unfortunately, in discussions on medical ethics, there is something rather tempting in the absolutist approach. It creates few conflicts between shades of right and wrong, good and bad, the individual good, and the common good. It avoids the issues and ignores the dilemmas. It refuses to acknowledge that human problems do not occur in black or white but in shades of grey. It is no help in solving difficult practical problems for which there may be no final "correct" answer.

During this century there have been many examples to indicate a widening gap between human experimentation and ethical sensitivity.<sup>2</sup> There has been controversy and public and professional disquiet about some studies in particular where doctors appeared to have abused the trust implicit in a doctor-patient relationship.<sup>3-5</sup> There have been calls for strict legislation to control human experimentation<sup>4</sup> and even for the complete prohibition of non-therapeutic experiments involving children.<sup>6</sup>

If strictly interpreted the various ethical codes appear to prohibit such experimentation except where this can be of direct benefit to the subject.<sup>7</sup> Furthermore, the law has been interpreted as not allowing parents to consent to such procedures on behalf of their children. If we believe that such research is imperative, as in a university community, I believe we must, the nagging questions must be resolved. Is informed consent of the subject always necessary? How can we ever solve the problem of infants and children? What additional safeguards are necessary to protect children as experimental subjects?

### Informed Consent

The codes, while stating general principles, specify only that informed consent to the research must be fully obtained from the subject.<sup>7</sup> The dangers are obvious. If done properly, obtaining informed consent can be time-consuming and difficult and can act against the investigator's interests. Therein lies the great temptation to bypass the consent process altogether. On the other hand, we all know the value of medical salesmanship. We know the phrase "Dr. So-and-so is wonderful—I would do anything for him." We must beware this "slippery slope" where infectious enthusiasm, charismatic salesmanship, or gentle persuasion descends to coercion and intimidation, no matter how subtle.

The only real protection for the individual lies in the scrupulousness, conscience, and personal integrity of the investigator. We must admit that truly informed consent is always impossible in theory and is very difficult to achieve in practice. As Ingelfinger has pointed out, consent is generally "informed" but only rarely is it "educated."<sup>8</sup> Nevertheless, if the information given is brief and to the point,<sup>9</sup> in language that can be understood, and repeated as necessary, with opportunities for questions and discussion, informed consent can be achieved to an extent that most would consider acceptable.

Infants and children require special consideration. For them informed consent is usually impossible, as it is for the mentally retarded and other legally incompetent groups. They are particularly helpless, vulnerable, and liable to exploitation. They rely on their parents for love and protection and to ask parents to agree to their child's participation in an experiment places a heavy burden on them. For the investigator there is a dual responsibility—to children and to their parents—and he

must assume a greater responsibility to ensure that the means and ends of the project are necessary, worthy, and possible at minimal risk. In this, his sense of conscience and compassion should inevitably make experimentation with children much more difficult than with adults who have consented of their own free will.

The Declaration of Helsinki states, "Clinical research on a human being cannot be undertaken without his free consent after he has been fully informed; if he is legally incompetent, the consent of the legal guardian should be procured." On this basis it is usually assumed that experimentation on children is permissible provided that the parents have consented. But the code also points out that ethical standards are only a guide and do not relieve doctors from criminal, civil, and ethical responsibilities under the laws of their own countries. The law in this country (specifically English law) has been interpreted differently by Sir Harvey Druitt, on whose advice the Medical Research Council incorporated the following statement into their guidelines of 1963: "In the strict view of the law, parents and guardians of minors cannot give consent on their behalf to any procedures which are of no particular benefit to them and which may cause some risk of harm."<sup>10</sup> It would seem that many investigators are at present performing experiments that are not only ethically suspect but may be illegal.

It is right that the law should have special regard for children and other vulnerable groups but the apparent prohibition cited above has no basis in statute or in any decided case in England or Scotland. It was based on one legal opinion, albeit a powerful one. This precise point has never been tested in court. Strictly speaking it applies only to minors below 12 years (in Scotland 12 years for girls and 14 years for boys). Between 12 or 14 years and 18 years, common law generally declares minors to be legally incapable of giving consent to a medical procedure or treatment, the intent being to protect the minor from harm resulting from ignorance and from situations where he cannot be expected to resist coercion to give consent. Many children are intellectually and emotionally capable of making such judgements below the age of 18 and the courts have frequently recognized this and modified their judgements accordingly. In these situations it is clearly prudent to obtain parental consent as well.

Curran and Beecher point out that Pappworth's assertion<sup>4</sup> that "The law both here and in America appears to be very definite, namely that parents either singly or together, cannot give valid consent to any action that is not for the immediate benefit of the child concerned" is not based on any legal authority whatsoever and represents a misinterpretation of the M.R.C. guidelines.<sup>11</sup> They emphasize that the guidelines couple "lack of benefit" with "risk of harm." This does seem to acknowledge the very great variety of experimental situations that exist, which Wolfensberger has called "different levels".<sup>12</sup> Obviously risk will vary enormously as will the degrees of distress or discomfort. Procedures with negligible risk may be painful and those with significant risk may cause no discomfort. There are also different levels of experimenter. They will vary in seniority, technical competence, knowledge, experience, and judgement. Above all, they will vary in sensitivity, compassion, and sheer common sense.

### Protective Mechanisms

Children must obviously be protected against physical and psychological abuse, but experimenters must be allowed reasonable freedom from excessive restriction if such research is to continue. Infringement of patients' rights and disregard for their welfare is certainly not acceptable nor in the public interest. Barber has stated: "the public interest requires the public to take upon itself a certain measure of responsibility and burden of the risks which those who seek to benefit it must incur on its behalf. While researchers have no ethical right to make their subjects martyrs for society, society has no right to make

martyrs of the experimenters who do harm in spite of their best and earnest conscientious efforts."<sup>13</sup> Let us avoid being extremists and absolutists. Surely it is possible for reasonable men and women to compromise without allowing principles to be compromised. What procedures can we develop or use more fully to ensure adequate protection for infants and children without inhibiting vital research? I believe that parental permission coupled with the integrity of the investigator must remain the basis for all other actions to protect the individual child against unworthy research.

#### PARENTAL CONSENT

Parents must surely be considered competent to give informed consent for minor procedures on children for experimental purposes just as we routinely ask them for permission for all kinds of treatment procedures. It is rare for parents to refuse consent when a project is seen to be reasonable, safe, and likely to cause minimal or no discomfort. It is true that children no longer are "chattels" and that parents, especially fathers, no longer have the powers of possession to the extent of life or death that they once had, and this is right. But society must not go too far in eroding parental responsibility and commitment to their children. They have a right to participate in any decision-making involving their children.

Parents usually love their children and will put their children's interests even above their own. We allow that they do have rights to give consent for treatment. We are beginning to recognize that they have certain rights in refusing treatment (what could be called "informed dissent") if they believe this to be in the best interests of their child.<sup>14</sup> Similarly, I believe they must be allowed the right of consent or dissent to involvement of their children in research where there is minimal risk and under circumstances allowable by social and professional consensus. It seems to me that our approach to this problem could deal with medical and lay views in a doctor-parents relationship similar to that described by Veatch as the contractual model.<sup>15</sup> For infants and children, the parents and physicians share ethical authority and responsibility. "The basic norms of freedom, dignity, truth telling, promise keeping, and justice are essential" to this relationship. If either party finds the terms contrary to his conscience, he may reject or break the contract.

If parents cannot give permission, then who can? If they cannot give permission then all experimentation must cease. The implications of that for future generations would be serious indeed.

#### ETHICAL CODES

Using our present codes as a base we must expect further evolution of medical and ethical codes moulded by the doctors, lawyers, philosophers, theologians, and ethicists of our times but they must be relevant to the times. Pellegrino has stated "simplistic repetitions of the Hippocratic oath as a sufficient base for all medical actions can only mean an abrogation of our responsibility for the consideration of some painful but urgent questions. Traditional medical codes are statements of ideals to be preserved, not immutable guides through all the new complexities generated by medical progress."<sup>16</sup> Surely he is right. The questions and problems of our times were never even imagined in the days of Hippocrates. To remain relevant, our ethical codes must be continually revised to reflect the current cultural values of the society and the times in which we as patients and we as doctors must live and work. Times do change and we must change with them. We must not lose sight of the fact that our new knowledge and skills must be modulated by codes of moral and ethical behaviour that can protect individual rights. If not, we will gain nothing. We must define these personal values that are sacrosanct and which we must not give up whatever the societal gain and those which can be invaded within certain limits for a worthy social

purpose. In no other way can we evolve and in no other way can public expectation of medical progress be fulfilled.

#### ETHICAL COMMITTEES

Difficulties in establishing and policing effective professional controls have led to calls for additional legislative and social controls.<sup>4</sup> Many individual medical centres have introduced their own ethical committees to advise on ethical matters. Much of their work involves the evaluation of projects using human subjects. These committees vary considerably in their membership, their influence, and in their interpretation of their role. Some require all projects to be submitted for approval, others leave it to the discretion of the investigators. Some require a formal, standardized, and fairly detailed procedure for gaining approval; others do not demand any particular routine and act relatively informally. There is no consistent policy.

Of course, this loose system of controls is open to abuse. Pappworth believes that ethical committees are not enough. He believes that enforcing legislation is necessary because such informal controls as are present, operate ineffectively. He has certainly been able to document evidence for this belief, but much of this evidence indicates the unthinking ignorance of the ethical implications of the new technologies that was present 20-30 years ago—the different ethical sensitivity of that period, rather than a failure of controls. Many of the professional, or joint social and professional, controls now either established or contemplated were not in existence. Establishing more effective ethical committees must now receive priority so that further abuses can be prevented. The ethical implications of modern medicine affect us all, professional and layman alike. It has been said that war is too important to be left to the generals; similarly, I would suggest that medical ethics has become too complex to be left to the doctors alone. Like it or not, we must be responsive to public demands for a voice in decision making.

#### THE LAW

There is another dilemma. How much can be left to conscience and how much should become law? Ethics and the law cannot always be kept separate but can or should a system of ethics necessarily be codified into law? I have no confidence that the law will be any more effective in yielding precise answers to many of these difficult questions. In view of the current uncertain stance of the law on matters involving human experimentation there may indeed be some merit in the introduction of legislation to protect the responsible and conscientious investigator from prosecution as a result of a private action for assault or trespass (offensive touching or invasion of the body). The law too must tread very warily. Professor Freund of Harvard has pointed out that the law is addicted to principle, thus it constantly fears setting bad precedent. He quotes F. M. Cornford in *Micro-cosmographia Academica*: "The principle of the dangerous precedent is that you should not now do an admittedly right action for fear that you or your equally timid successors should not have the courage to do right some future time, which ex hypothesi is substantially different but superficially resembles the present one. Every public action which is not customary either is wrong, or if it is right, is a dangerous precedent. It follows that nothing should ever be done for the first time."<sup>17</sup>

What is certain is that the law cannot remain indefinitely aloof from these issues. Sooner or later it may be tested in court. It is up to all of us to ensure that professional controls are not only adequate, but seen to be adequate. If we abuse our own controls, it is likely that resulting legislation would be very restrictive. A closer interchange between law and medicine may lead to clearer guidance. The law though conservative, as indeed it must be, can also be creative and responsive—"it could come to recognize a right of experimentation on human beings. Social interests and

expectations if they are in fact justified, can expect eventually to be reflected in the law."<sup>17</sup>

#### TEACHING OF MEDICAL ETHICS

I believe that university medical centres must assume an additional obligation—the incorporation of medical ethics into the undergraduate curriculum. Some have already done this, often in response to the demands of the students themselves. At other schools there are no formal or even informal programmes, though they might rather smugly claim that discussions on ethics are inseparable from their normal curriculum. A doctor might still insist that for his patients all ethical decisions (like medical ones) are his responsibility and his alone. Nevertheless, as has been pointed out by Willard Gaylin, there is a fine line between the assumption of responsibility and the arrogation of power.<sup>18</sup> A doctor must clearly maintain a leadership role but he cannot be an expert or the final arbiter on many of the ethical decisions of today. Indeed, it is legitimate to ask if he should be any more able to make a "correct" ethical decision than a nurse, a medical student, a minister, a lawyer, or any involved and informed layman. At the least there should be a demonstrable effort to familiarize students and faculty with the vast range of ethical issues involved in medicine today. With the vast complexity of modern medical life it cannot be assumed any longer that because we have chosen medicine as a career, we have a natural endowment of ethical wisdom, an automatic ability to know right from wrong in all medical actions.

#### EDITORIAL CONTROL

An additional incentive to ethical research is now provided by the medical journals. Editors have recently emphasized that they will not accept for publication any paper, whatever its scientific merits, where ethics have been violated.<sup>19 20</sup> There is no doubt that the dictum "Publish or perish" with the resulting insecurity and pressure on young ambitious investigators has been a factor in pushing experimentation to unacceptable limits in the never-ending chase for data. Some paediatric journals, while introducing their own controls, have emphasized again the peculiar ethical difficulties that are raised by research on children and one editorial has emphasized that extreme positions run counter to common sense and could be harmful "by preventing studies which are both ethical in spirit and likely to benefit humanity in general without real risk to the individual".<sup>19</sup>

#### Guidelines for Non-therapeutic Research on Infants and Children

It is suggested that the following guidelines could protect the individual child from risk and exploitation, and at the same time protect the right to pursue worthy scientific inquiry towards making all children healthy.

(a) It must again be emphasized that, like the adult, the infant and child derives his only real protection from the conscience of the investigator himself. In practice this is best served by the investigator also being responsible for the care and welfare of the child—that is, the doctor. If the investigator is based in a laboratory, then ethical responsibility should be shared by the caring doctor. It should also be obvious that in a large hospital or medical centre the conscience of the investigator can be broadened to be a "collective conscience." Colleagues, even if not actually co-investigators, are usually aware of research being proposed or actually carried out.

(b) Though attention has been drawn to the limitations of informed consent, I believe that in practice it is possible to an acceptable extent, and should remain the ideal. It should be obtained before any research is initiated. Deceit or subterfuge should not be tolerated, however tempting and however noble

the aims. I have stressed the impossibility of consent from infants and young children. I believe that parents must be considered competent to give consent for their children under 14 years of age. Consent may be obtained with appropriate safeguards from minors 14 years or older, but parental consent is also advisable. As far as possible, the consent of both parents should be obtained and there should be no disagreement between them—in that case, consent would not be valid. No research for purely experimental purposes should be contemplated without discussion with the parents.

(c) For pregnant women, infants, and children, the requirements for informed consent should be particularly stringent and be demonstrably valid: for example, a brief written statement about the project could be prepared in language that parents can understand, and a copy retained by them. Parents should be aware of their rights to withdraw consent at any time should reflection or future events give them cause for concern. The investigator must appreciate the added responsibility he assumes "for first doing no harm."

Though the interpretative dangers of exceptions are recognized—the "slippery slope" again—an exception to requirements (b) and (c) might be made in the frequent clinical situation where small additional samples of blood are obtained during a diagnostic or treatment procedure and are used for legitimate control purposes, for epidemiological studies, or to provide a basis for normal values. Such studies carry no risk or discomfort additional to the risk of the procedure justified by diagnostic or therapeutic indications.

(d) All projects for research involving infants and children should be reviewed in advance by a hospital or medical centre ethical committee composed of professionals and informed lay persons. It should obviously include a paediatrician but be dominated by no particular group. It must contain a member of the nursing staff, who are so often closely involved in research on patients, are in receipt of questions from anxious parents, but are so often not consulted or are kept in ignorance of the details of the project. The committee should contain individuals who are not themselves closely involved with research on human beings. Justice should not only be done, but be clearly seen to be done. The ethical committee should be able to suggest modifications to experimental design and give advice in any form it feels appropriate. It should also have power to prevent research it clearly feels is unethical.

(e) Every non-therapeutic investigation requires special justification for extension to children—for example, the metabolic problems unique to the developing infant. The project investigator should ask himself certain questions and be prepared to satisfy the ethical committee on the answers:

Why is this project necessary? What is the background information leading to this experiment?

Can the question be answered in any other way? Is animal experimentation relevant?

What are the known risks?

Is the study really feasible, for example, are there adequate personnel, time, equipment, and facilities? How many experimental subjects will be necessary to achieve a result? Has expert statistical advice been obtained?

Will controls be used and how will they be selected? What will they be told?

In obtaining consent, what exactly have the parents been told? A copy of the "description for parents" discussed earlier can be included for the information of the ethical committee.

(f) Though this can be a fallible guide, the investigator should ask himself as honestly as he can if this is an experiment to which he would freely submit his own child if appropriate. Are the risks that small? If he feels hesitant or uncomfortable about this question he should not proceed. His patients have a right to expect that sort of protection.

Finally, "let us remember always that whatever truth we may get by scientific study about ourselves and our environment, it is always relative, tentative, subject to change and correction, and that there are no final answers."<sup>21</sup>

## References

- <sup>1</sup> Ramsey, P., *New England Journal of Medicine*, 1971, **284**, 700.
- <sup>2</sup> Katz, J., *Experimentation with Human Beings*. New York, Russell Sage Foundation, 1972.
- <sup>3</sup> Beecher, H. K., *New England Journal of Medicine*, 1966, **274**, 1354.
- <sup>4</sup> Pappworth, M. H., *Human Guinea Pigs*. London, Routledge and Paul, 1967.
- <sup>5</sup> Beecher, H. K., *Research and the Individual: Human Studies*. Boston, Little, Brown & Co., 1970.
- <sup>6</sup> Baumslag, N., and Yodaiken, R. E., *New England Journal of Medicine*, 1973, **288**, 1247.
- <sup>7</sup> *Codes of Ethics*. New York, World Medical Association, 1973.
- <sup>8</sup> Ingelfinger, F. J., *New England Journal of Medicine*, 1972, **287**, 465.
- <sup>9</sup> Epstein, L. C., and Lasagna, L., *Archives of Internal Medicine*, 1969, **123**, 682.
- <sup>10</sup> *Responsibility in Investigations on Human Subjects*. London, Medical Research Council, 1963.
- <sup>11</sup> Curran W. J., and Beecher, H. K., *Journal of the American Medical Association*, 1969, **210**, 77.
- <sup>12</sup> Wolfensberger, W., *Science*, 1967, **155**, 47.
- <sup>13</sup> Barber, B., *The Public Interest*, 1967, **6**, 101.
- <sup>14</sup> Duff, R. S., and Campbell, A. G. M., *New England Journal of Medicine*, 1973, **289**, 890.
- <sup>15</sup> Veatch, R. M., in *Hastings Center Report*, Vol. 2. New York, Hastings-on-Hudson, 1972.
- <sup>16</sup> Pellegrino, E. D., in *Human Aspects of Biomedical Innovation*, ed. E. Mendelsohn, J. P. Slazey, and I. Taviss. London, Oxford University Press, 1971.
- <sup>17</sup> Freund, P., *New England Journal of Medicine*, 1965, **273**, 687.
- <sup>18</sup> Gaylin, W., in "The Teaching of Medical Ethics", ed. R. M. Veatch, W. Gaylin, and C. Morgan. New York, Hastings Center, 1973.
- <sup>19</sup> *Archives of Disease in Childhood*, 1973, **48**, 751.
- <sup>20</sup> *Journal of Pediatrics*, 1973, **83**, 709.
- <sup>21</sup> Leake, C. D., *New York State Journal of Medicine*, 1960, **60**, 96.

## Any Questions?

We publish below a selection of questions and answers of general interest

### Health Hazards of Cooking Oils

*Are cooking oils a possible cause of gastric cancer?*

At least seven vegetable oils are commonly used as cooking oils: peanut, olive, rapeseed, soyabean, sunflower, corn oil, and cottonseed oil. In the raw state they contain varying amounts of polycyclic aromatic hydrocarbons derived principally from endogenous metabolic processes in the seed or fruit. Peanut oil, in addition, may contain aflatoxin. After the refining process the oils contain only minute amounts of carcinogenic benzpyrene and other, non-carcinogenic, hydrocarbons<sup>1</sup> while aflatoxin is removed completely from peanut oils. It is estimated that not more than 1 µg of benzpyrene is added to the daily diet in Britain. Other sources, chiefly flour and vegetables, contribute at least twice this amount and smoked, grilled, or roasted foods could contribute considerably more.<sup>2</sup> There is thus no reason for suspecting that cooking oils present a cancer hazard greater than other traditional articles of diet on the basis of their benzpyrene content.

As cooking oils change chemically when heated there has been concern about the possibility that carcinogens might form during cooking, especially deep frying, because of the high temperatures (200-250°C).<sup>3</sup> Unfortunately, there are no available epidemiological data on the association between consumption of fried food and gastric cancer, but several experimental studies have been done—chiefly in rats—to explore the carcinogenic activity of heated cooking oils. The administration of refined, unheated cooking oils to rats and mice did not increase the natural incidence of tumours but the administration of similar concentrations of oils, heated up to 200-250°C, has been associated with the development of gastric papillomatosis.<sup>5,6</sup> These tumours were usually benign and confined to the squamous portion of the stomach. Claims that carcinoma of the glandular region of the stomach has been induced by feeding preheated fats at high concentrations<sup>5</sup> have not been substantiated by other authors, though atypical epithelial hyperplasia has been mentioned.<sup>6</sup> It is difficult to accept these data as indicative of carcinogenic hazard to man. The squamous region of the rat stomach has no anatomical counterpart in man and is known to become hyperplastic and to develop papillomas as a result of a wide variety of dietary deficiencies, in particular Vitamin A. Deficiency in this vitamin readily occurs when rats are fed a diet rich in heated fats. So there does not appear to be any evidence available to alter the view of Pea-

cock<sup>7</sup>—namely, that the tumour-like lesions induced in rodents, under experimental conditions such as those mentioned above, do not constitute valid evidence for the carcinogenicity of heated oils.

- <sup>1</sup> Howard, J. W., Turicchi, Elizabeth, W., White, R. H., and Fazio, T., *Journal of the Association of Official Analytical Chemists*, 1966, **49**, 1236.
- <sup>2</sup> *Food and Cosmetics Toxicology*, 1972, **10**, 571.
- <sup>3</sup> Beck, S., and Peacock, P. R., *British Medical Journal*, 1941, **ii**, 81.
- <sup>4</sup> Poling, C. E., Eagle, E., and Rice, E. E., *Lipids*, 1970, **5**, 128.
- <sup>5</sup> Roffo, A. H., *American Journal of Digestive Diseases*, 1946, **13**, 33.
- <sup>6</sup> Zaldivar, R. S., *Nature*, 1963, **199**, 1300.
- <sup>7</sup> Peacock, P. R., *British Journal of Nutrition*, 1948, **2**, 201.

### Notes and Comments

**Hair on a Girl's Lip.**—Dr. Ian W. CALDWELL (Southampton) writes: The quite ambivalent reply given by your expert (Any Questions?, 9 February, p. 239) about treatment of a 16-year-old girl with upper lip hirsutism prompts me to repeat what I have stated before that any one who comes for medical advice will already have tried—and found wanting—most of the very temporary listed remedies and is pleading for a safe, permanent cure. Depilatory creams commonly cause a contact dermatitis, an epilating wax is a painful mass plucking, abrasive pads are also painful and, in dark haired patients, unhappily show the five o'clock shadow phenomenon, as does the use of razors. I have been informed by an internationally famous electrologist that plucking causes distorted follicles, and it is this rather than alteration of hair growth or thickness which proscribes this method. The B.M.A. Ethical Committee has made it ethical for a doctor to refer a patient for electrolysis to members of the Institute of Electrologists Ltd. if N.H.S. facilities within a department of dermatology do not exist locally. This treatment is not painful, does not cause scarring, and the number of sessions is quite small. Advice given must be unequivocal or the patient will find her own way to the wrong establishment.

OUR EXPERT replies: I do not think one can be other than ambivalent with a question of a 16-year-old girl without actually seeing the situation. Electrolysis is clearly the most permanent but a lot of 16-year-olds have not yet developed hirsutes that need this treatment. Often the treatment is still painful, slow, scars, and, unless done by real experts, one has to find the competence of one's own local electrologist.